

## A. Cover Sheet

1. Specify: ☐ agricultural project or ☒ individual application or project  
☒ urban project ☐ joint application
2. Proposal title---concise but descriptive: Los Angeles area Central District indoor/outdoor water savings survey program, including installed devices, public information and school education.
3. Principal applicant --- organization or affiliation: Southern California Water Company
4. Contact---Name, title: Kirk Brewer, Water Use Efficiency Manager
5. Mailing address: 1920 W. Corporate Way, Anaheim, California 92801
6. Telephone: (714) 535-7711 x265
7. Fax: (714) 535-8616
8. E-mail: kbrewer@scwater.com
9. Funds requested---dollar amount: \$40,889.45
10. Applicant cost share funds pledged---dollar amount: \$66,591.39
11. Duration---(month/year to month/year): March 2001 through June 2001
12. State Assembly and Senate districts and Congressional district(s) where the project is to be conducted:  
State Assembly districts: 50, 54, 56, 58  
Senate districts: 27, 30, 35  
Congressional districts: 33, 34, 38, 39
13. Location and geographic boundaries of the project: Central Customer Service Area (see attached service map)
14. Name and signature of official representing applicant. By signing below, the applicant declares the following:
  - the truthfulness of all representations in the proposal;
  - the individual signing the form is authorized to submit the application on behalf of the applicant;
  - the applicant will comply with contract terms and conditions identified in Section 11 of this PSP.

Kirk Brewer  
*(printed name of applicant)*

\_\_\_\_\_  
*(date)*

\_\_\_\_\_  
*(signature of applicant)*

## B. Scope of Work

### 1. Executive Summary

The **Learning to be WaterWise Program** (Program) combines classroom activities with hands-on retrofit projects that students perform in their homes with their families. This combination yields tangible conservation results and strong learning impact, effectively shaping new resource use behavior and attitudes.

This program directly addresses priorities of conservation impact and cost effectiveness through a proven, high visibility program format, combining a turn-key set of classroom activities with hands-on home projects. The Program is comprehensive, providing all materials, supplies, teaching tools and support needed by teachers and participants.

Students conduct an audit to determine areas in their homes where their families are using water inefficiently. Families work together to improve efficiency by changing habits and through the installation of the conservation technologies provided to each student in their “Resource Action Kit.” These kits include conservation measures and simple test equipment that enable the family to determine which water and resource conservation opportunities exist in their home. These activities foster family cooperation and help educate parents on the benefits and wisdom of conservation.

The **Learning to be WaterWise** program combines classroom environmental education activities with hands-on home projects to build knowledge and awareness of environmental issues and impacts. An important Program goal is the measurable, lasting residential water and energy savings, which result from the home installation of water efficiency technologies by students and parents. Another Program goal is the collection of data from home audits studying household resource usage. Students complete the audits during the program and the information will be used to design future community efficiency programs and to assess current resource usage.

This program is targeted at the households of sixth grade students. Teachers implement the program in the classroom and assign homework activities which use student Resource Action Kits (Kits) to install conservation technologies at home. Innovative tools like an interactive website, 3D CD-ROM learning game, contests, videos, a home survey and the Kits inspire student and family participation. Sound educational curricula (which meets state learning requirements), exciting “hands-on” tools and program incentives (opportunity to earn university graduate credit, flexible scheduling for activities) help ensure successful teacher participation and implementation.

The Program will consist of 2,000 surveys and include installed showerheads, kitchen “flip” aerators and bathroom aerators. It will be implemented by sixth grade students from schools throughout Southern California Water Company’s Central District Customer Service Area.

At the initial level of 2,000 households, the **Learning to be WaterWise** Program will yield the following results:

- Generate measurable savings of water and wastewater from the replacement of hardware in 2,000 households
- Replace an estimated 2,000+ showerheads and 2,000+ bathroom and kitchen flip aerators

- Check 2,000+ toilets for leaks and water consumption and provide replacement flappers where needed and through a separate program, the opportunity to receive free ULFT's when the survey results indicate there is a need
- Collect household audit information for 2,000 homes to more effectively target future indoor and outdoor conservation programs
- Deliver information on other water saving opportunities including literature on ground covers, water conserving plants, irrigation systems and inside water saving tips
- Build knowledge of California water sources, water treatment, water quality, and water issues for 2,000 sixth grade students and teachers
- Shape new resource use habits and attitudes for 2,000 households

## 2. Statement of Critical Issues

The balance of water use and supply is an urgent concern throughout California. Water supplies to Southern California from the Colorado River Aqueduct and the State Water Project are decreasing even as population continues to increase, making the need to conserve California's water even more crucial.

As the population of California continues to grow, demands for additional water supply will also grow. Developing new water supplies to meet these increasing demands, treating this water and building new infrastructure to deliver the water is very expensive. Conservation is unquestionably the most cost-effective approach to balancing the needs of the state, and the best programs rely on a combination of installed technologies and customer education. Children are often recognized as the best opportunity for shaping new attitudes and habits, while spreading knowledge to their families and communities.

The **Learning to be WaterWise** Program meets the standards the California Urban Water Conservation Council (CUWCC) has established for Best Management Practices (BMP) #1 Water Survey Programs for Single-Family Residential and Multi-Family Residential Customers, BMP #2 Residential Plumbing Retrofits, BMP #7 Public Information Programs and BMP #8 School Education Programs.

The incentives built into this program promote the installation of needed retrofit components and therefore, enhance the cost-effectiveness and resultant water savings.

Program success is directly linked to enthusiastic teacher support and involvement. The design and content of the program motivates teachers to sign up and participate eagerly. There are several incentives to ensure this:

- The program satisfies numerous State Standards and helps teachers meet their teaching requirements.
- The program is flexible in structure, allowing teachers to schedule activities around existing lessons. The program can be completed in two weeks or a few months.
- Program content and activities are simple enough and well described through program materials so that additional in-service training sessions are generally not necessary.
- All participating teachers receive a minimum \$100.00 gift certificate for school supplies and materials of their choice at an outlet such as Office Depot or Staples for each class involved.
- Teachers have the opportunity to earn Graduate Credits through Utah State University.

Students love the program and are highly motivated to complete the survey booklets and install the conservation devices provided in the Kits. Other student incentives include:

- Tools within the Kit such as a solar calculator and a mini measuring tape are for the students to keep.
- Each student receives a “Captain Willie Waterdrop” wristwatch, a zipper pouch filled with handy school supplies, a personalized certificate of achievement, as well as family admission coupons to the Aquarium of the Pacific in Long Beach.
- The class with the highest score for this program will receive a full day field trip to the Long Beach Aquarium or similar attraction.

For parents, in addition to receiving free water saving devices and other information that can result in reductions to their water bill, this program involves them in their child’s education and school.

### **3. Project Nature, Scope, and Objectives**

This Project will deliver the **Learning to be WaterWise** program to 2,000 students, teachers and households in Southern California Water Company’s Central District Customer Service Area. Through the curriculum content and the home installations, students and their families will effectively gain knowledge and skills for resource awareness and conservation, while generating tangible energy, water, and wastewater savings from simple changes in their everyday habits.

The Program is delivered through 6th grade classes in public schools.

Step 1: Teacher Outreach and sign-up - brochures and written descriptive materials, introductory videos and phone calls are all used as part of the outreach, although mailings are the primary avenue. Teachers adopt the program readily, because it is short, flexible in timing to allow for easier scheduling around existing lesson plans, and designed to address all four major subject areas required by state and national learning standards.

Step 2: Program Shipment - Once the teacher has enrolled in the Program, classroom materials are sent directly to them.

Step 3: Program Implementation - Teachers conduct classroom learning activities as provided in their Teacher Binders and Student Activity Guides, which every student receives. Students first learn about the value of water from classroom activities and through an interactive CD ROM that provides a fun learning experience to help them discover ways to conserve water and other resources in and around the home. This CD ROM is a key component of each student’s “Resource Action Kit”. The Kits are a fun, hands-on vehicle to achieve the resource savings results and collect the home resource (survey) data.

Each kit contains:

- Flow Rate Test Bag with instructions
- Drip Gauge with instructions
- Mini Tape Measure
- Toilet Leak Detection Tablets with instructions
- Solar Calculator
- Low Flow Showerhead with installation instructions

- Kitchen Flip Aerator
- 2 Bathroom Aerators
- “Take the Home Water Survey with Captain Willie Waterdrop Survey Booklet

The booklet is in the form of a “treasure hunt”. The mascot, “Captain Willie Waterdrop” takes the student who is now a “survey analyst” on his/her own private water-saving treasure hunt. The Booklet is used to determine areas in the student’s homes where water is being used inefficiently. Using the Booklet as a guide, families work together to improve efficiency through a change in water use habits. They also improve efficiency through the installation of conservation technologies including needed low-flow showerheads, kitchen flip aerators and bathroom faucet aerators. These devices are included in the Kit and additional supplies are available from the teacher on an “as-needed” basis.

These Kits also include simple test equipment such as dye tablets to check for toilet leaks and drip gages used to determine the amount of water wasted as a result of faucet leaks. These tools enable the family to determine which water and other resource conservation opportunities exist in their home. Incentives are provided to encourage students to record their results and return old showerheads, or new showerheads and aerators that were determined to be unnecessary to install.

The Booklet also assists the students in learning how to identify the type of irrigation system they have, and provides some hints and recommendations concerning ground cover, drought tolerant plants, water coverage, watering techniques and water schedule changes by season. Together, these activities foster family cooperation and help educate parents about the benefits of conservation.

The installation activities and home survey complement the lessons that students learn in the classroom, and provide the ultimate ‘real-world’ application for their new knowledge.

Step 4: Program Completion and Results Collection - Reporting Mechanisms (actual pre/post tests; Household Report Cards, Home Checkups, Teacher Evaluations, Thank You letters from students) are built in to the program. When the Booklet has been completed at home, the student brings it back to the classroom. Teachers collect the Booklets and returned items. The Booklets are immediately sent to the National Energy Foundation in a prepaid, preaddressed envelope. The NEF tabulates and records the Survey results by student and class.

One of the central lessons and objectives of the **Learning to be WaterWise** program is the demonstration that the savings achieved by an individual is multiplied dramatically by the cumulative effect of everyone’s effort. The communication and calculation of savings results is a key activity throughout the program. In addition, the pre and post test measures knowledge gained, while the home surveys are collected and tabulated to record overall resource use habits, as well as verification of the savings achieved.

The water use survey component of the Program has been patterned after the criteria established by the Residential Survey Program Advisory Committee (RESPAC) of which SCWC is an active participant. Many features of the field tested RESPAC criteria have been combined into a customized conservation module that is cost effective and maximizes the benefit to the customer, to SCWC, Central Basin Municipal Water District, Metropolitan Water

District of Southern California, the United States Department of the Interior, Bureau of Reclamation, Lower Colorado Region, Southern California Area Office and CALFED.

#### **4. Methods, Procedures, and Facilities**

The **Learning to be WaterWise** Program contains several evaluation elements within its design. One key feature is a pre and post-program test, where students take the identical test before and after the program to objectively measure knowledge actually gained from the program. Another tool is the Household Report Card, which is a summary of the positive actions students have done in their own homes as part of the program. These Report Cards are then shared with parents and with the program administrators as tools to measure progress, savings, and impact. Copies of Home Checkups (surveys) are also collected for data summary and review by the program administrators.

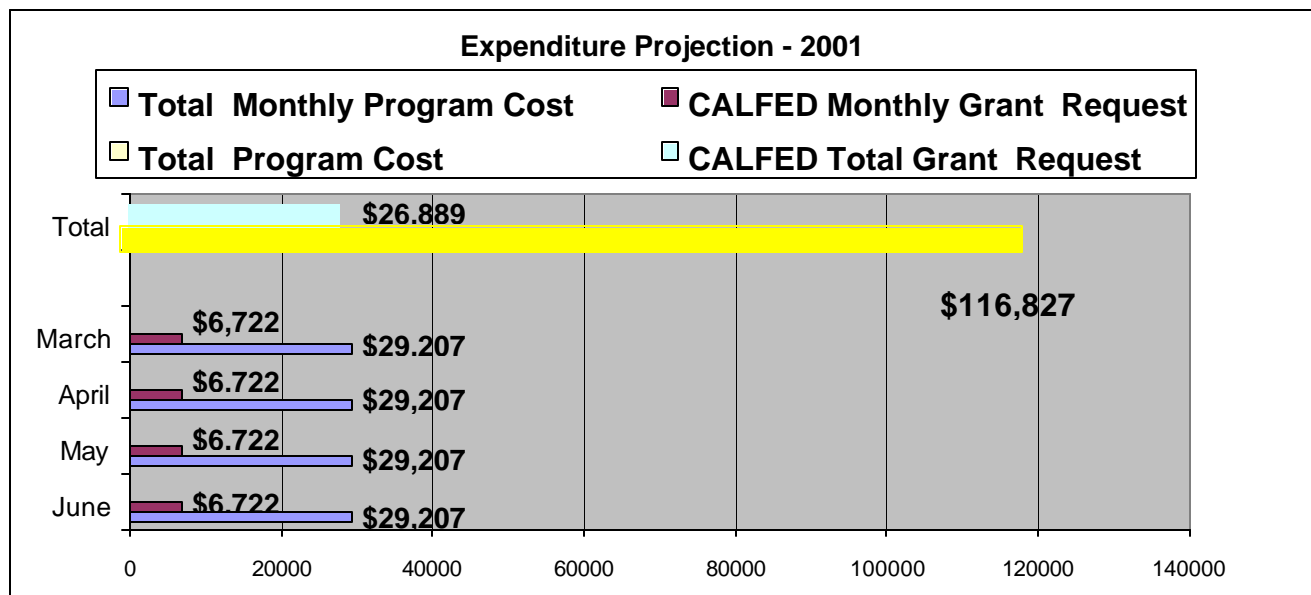
The savings data collected from the Booklets will be summarized to show the savings by measure and the program overall. Actual savings results are verified by the return and independent testing of pre-existing showerheads that were removed from homes by students. This ensures that the savings figures calculated by classrooms as part of the program are statistically valid. Exact numbers of participation are verified by the Report Cards, Teacher Evaluation forms, and Activity Progress Charts (in-room tools where students mark their progress). These three separate tools combine to provide a great system of multiple verification.

The data received from the Booklets also assists in determining the intervention and device saturation levels for the service area. The data will also be used to target future programs such as ULFT distributions and Et controller installations for residential landscape. This data will also provide a basis to establish future landscape water budget targets.

## 5. Schedule

## Central District

| Major Program Tasks   | Deliverable Time-frame | Implementation Time-frame | Projected Program Cost w/out CALFED Funding = \$116,827 | Projected CALFED Grant Request Amount = \$26,889 |
|---|------------------------|---------------------------|---|--|
| SCWC to order conservation devices for survey kits, and send to NEF.  | January - February     | January - February        | \$ 29,207   | \$ 6,722   |
| NEF to identify schools, classes, and teachers. NEF to assemble survey kits and mail to teachers, along with instructions.  | February - March       | February - March          | \$ 29,207   | \$ 6,722   |
| Courier picks up survey kits, and sends back to NEF. SCWC visits classrooms and provides incentives to students and teachers for participating in program.                            | May - June             | May - June                | \$ 29,207   | \$ 6,722   |
| NEF to tabulate program results from booklets and create reports for the participating agencies. NEF to identify the Grand Prize Winners. SCWC to coordinate fields trip for winners. | June                   | June                      | \$ 29,207   | \$ 6,722   |
| <b>Totals</b>   |                        |                           | <b>\$ 116,827</b>                                       | <b>\$ 26,889</b>                                 |



## **6. Monitoring and Assessment**

Upon completion the Booklets are immediately sent to the National Energy Foundation in a prepaid, preaddressed envelope. The NEF tabulates and records the Survey results by student and class. Individual household report cards, classroom “team score cards” and individual “student certificates of achievement” are sent to SCWC for their use in meeting with teachers and students. This data will be incorporated into the SCWC Customer (“service address”) Conservation Screen. This data will also be used for the generation of Program reports, and prize award determination.

The data received from the Booklets also assists in determining the intervention and device saturation levels for the service area. The data will also be used to target future programs such as ULFT distributions and Et controller installations for residential landscape. This data will also provide a basis to establish future landscape water budget targets.

## **C. Outreach, Community Involvement, and Information Transfer**

### **1. Outreach Efforts**

This Program is being offered to schools throughout SCWC’s Central District Customer Service Area, which includes a number of economically depressed cities. This service area includes populations at or below the poverty level. Based on the latest federal census data available, the cities or communities benefiting from this program are shown with the percent above or below the Los Angeles County-wide median household income: Florence-Graham (54%), Compton (71%), South Gate (78%), Hawaiian Gardens (84%), Artesia (104%), Norwalk (109%), Bell (64%), Bell Gardens (68%) and Willowbrook (64%). Many of these areas also have high minority populations. The benefit to these communities as a result of the audits and installed devices include reduced water and energy costs.

### **2. Training, Employment, and Capacity Building**

Training will be provided to teachers and students. The training received by teachers will have an on-going benefit as a result of their heightened awareness of water resource issues. Teachers overall awareness of these issues will extend beyond this Program to future classes.

### **3. Information Dissemination**

This Program will reach 2,000 students who will provide information to their parents, other family members, friends and neighbors. Tabulation reports will be submitted to all participating agencies and these agencies are at liberty to use Program information as they deem useful to advance conservation.

### **4. Letters of Notification**

Provided as an attachment to this proposal are copies of the first page of the partnering proposals that were sent to the Central Basin Municipal Water District (CBMWD), Metropolitan Water District of Southern California (MWDSC), and the U.S. Department of the Interior – Bureau of Reclamation (USBR).



## **D. Qualifications of Applicants, Cooperators, and Establishment of Partnerships**

### **1. Project Managers**

Southern California Water Company – Kirk Brewer, Water Use Efficiency Manager  
Eight years of conservation related experience; 12 years of water utility operations experience; over 23 years of project management and implementation experience.

Central Basin Municipal Water District – David Hill, Conservation Coordinator  
Seven years of increasing conservation and recycled water experience, including CBO coordination and project management.

National Energy Foundation – Dave Munk, Program Manager  
Four years experience promoting and managing LivingWise Program.

### **2. External Cooperators**

The National Energy Foundation (NEF), a 501(C)3 non-profit educational organization was formed in 1978 to develop and distribute instructional materials relating to water, energy, and other resource education topics. The first version of the **Learning to be WaterWise** Program was introduced in 1992, following extensive market research and material development. Tremendous acceptance caused participation to grow to more than 300,000 participants within the first few years.

The role of NEF will be initial teacher contact and obtaining teacher commitments, mailing teacher booklets and student kits, providing help and answering questions when necessary by providing an 800 number to teachers and students, collection of data and summarizing data into reports.

### **3. Partnerships**

Southern California Water Company has formed a partnership with the National Energy Foundation, Central Basin Municipal Water District, the United States Bureau of Reclamation, school districts, individual schools and teachers.

## **E. Costs and Benefits**

### **1. Budget Summary and Breakdown**

The estimated program cost per unit is \$58.41.

Total Program costs are estimated to be \$116,827.00. Cost sharing requested from CALFED is \$40,889.45.

(See Table 1 for Budget Breakdown)

### **2. Budget Justification**

Company labor costs cover program administration, interface with teachers and students. Costs for supplies include devices to be installed.

### 3. Benefit Summary

The total water savings from this program are estimated at 161 acre-feet. Today's value of the conserved water for SCWC is \$478.00 per acre foot (based on purchased water cost from Central Basin Municipal Water District) or, total savings of \$76,958.00. The water savings per year is based on the four year program life [A & N Technical Services report (2000, page 2-20)] or 40.25 acre feet per year.

a.) NPV (Net Present Value) Method:

NPV = Discounted benefits – costs or;  
 $\$66,669 - \$116,827 = (\$50,158)$

BCR (Benefit Cost Ratio) Method: (Assumes total program cost funded by SCWC)

BCR = Sum of Discounted Benefits/Sum of Costs or;  
 $\$66,669 / \$116,827 = .5707$

Simple Pay-Back Analysis:

Savings Per Year = 40.25 AFY

SCWC @ \$478/AF x 40.25 AFY = \$19,240/year or

$\$116,827 / \$19,240 = 6.07$  years

b.) Qualitative benefits for this Program include a dynamic change in the students' behavior regarding water resources this effectively will have lifetime benefits.

### 4. Assessment of Costs and Benefits

a.) Assumptions relating to BMP #1 (Conduct water surveys that include both indoor and outdoor components. Provide recommendations and install plumbing retrofit devices where needed.) :

- Single-family water usage = 428 gpd/unit with 29% or 124.1 gpd for outdoor use.
- Multi-family water usage = 126 gpd/unit with 20% or 25.2 gpd for outdoor use.
- Water savings from indoor leak detection, not including toilet leaks = 1.2 gpd per residence.
- Water surveys decrease outdoor water use by 10% or 12.4 gpd/SF unit and 2.5 gpd/MF unit.
- Each water survey costs \$27.91
- The life span of a water survey is four years.
- Water savings from indoor plumbing retrofits are tracked under BMP #2. Only water savings from decrease in outdoor water use and water saving from indoor leak detection are tracked in BMP #1 to avoid double counting of water savings.

Assumptions relating to BMP #2 (Install plumbing retrofit devices in single and multi-family residences.):

- 22.5% of residences have low-water-use fixtures.
- There are an average of 1.2 showers, 1.8 toilets, and 2.7 faucets (1 kitchen faucet and 1.7 other faucets) per residence.
- Water savings from one low-flow showerhead = 2.9 gpd
- Water savings from one faucet aerator = 0.6 gpd
- Water savings from one toilet flapper = 8 gpd; assume 10% of toilets leak.
- Water savings from kitchen "flip" aerator = 1.4 gpd.
- Indoor water savings = 7.34 gpd/unit.

- The BMP will cost an average of \$30.50 per residence.
- The life span of the retrofit devices is four years.
- Current cost of CBMWD water is \$478.00 per acre-foot.

b) All figures in this proposal are expressed in year 2000 dollars. All costs are incurred in year 1, thus total program cost of \$116,827 is not discounted.

c) All costs in this proposal are stated in present values.

d) Present Value of Costs and Benefits

|                                 |              |
|---------------------------------|--------------|
| Total cost of Project:          | \$116,827.00 |
| Total Cost Per Acre Foot:       | \$725.63     |
| SCWC's Cost Per Acre Foot:      | \$411.18     |
| USBR's Cost Per Acre Foot:      | \$62.11      |
| CALFED Cost Per Acre Foot:      | \$226.01     |
| Cost Per Unit (Surveys w/kits): | \$58.41      |

There are no non-quantified costs associated with this program. The non-quantified benefits to all parties affected by this Program are environmental. Conservation reduces demands on water diversions from the Bay Delta and the Colorado River. When less water is diverted, water quality in the Delta improves and more water is available for the delicate ecosystem that relies on it.

This Program reduces indoor and outdoor water use. Outdoor savings result from proper watering schedules as recommended by the audit. Proper watering schedules reduce runoff to storm drains, rivers, and the ocean. Indoor savings result from behavioral changes and the installed devices. This reduces water demand as well as demands on wastewater treatment facilities, saving both water and energy.

Conservation contributes to a healthier environment and saves precious resources for future generations.

**Kirk S. Brewer**  
**Water Use Efficiency Manager**  
**Southern California Water Company**

February 2001

Mr. Brewer is the Water Use Efficiency Manager for Southern California Water Company (SCWC), an investor-owned utility serving water to 1 out of 30 people throughout California. Mr. Brewer's office is currently located at the Company's headquarters in San Dimas, CA.

Mr. Brewer grew up in the water industry, working for "fun" in a meter repair shop at the age of 10 and on pipeline jobs at the age of 13. He came to SCWC in 1987 as an expert in the fields of construction, procurement, operations, construction equipment and management. This breadth of experience has allowed SCWC to utilize Mr. Brewer's talents as the District Manager of the Company's largest District, the Director of Operations Support (which included oversight of construction, procurement and budgets) and in his current role of Water Use Efficiency Manager.

As the Water use Efficiency Manager, Mr. Brewer has a special interest in assuring that water is used wisely. To achieve this goal, he works closely with local officials, cities, government agencies, other water utilities/agencies and a number of water related special interest groups.

Since being appointed as SCWC's Water Use Efficiency Manager, he has worked closely with the Company's Regulatory Affairs Department to develop, quantify and perform cost effectiveness analysis for the Company's conservation programs. He has also represented the Company before the California Public Utilities Commission on water conservation proceedings. SCWC is now recognized by the Commission as the leader in Urban Water Conservation.

Mr. Brewer developed SCWC's conservation ethic and continues to provide oversight for all of SCWC's conservation programs. SCWC's programs are implemented using Contractors and Community Based Organizations (CBOs). The use of CBOs has often included the training of their personnel in basic job skills for conservation and operational tasks. This activity has resulted in over 15 such individuals securing either full-time careers or alternatively, part-time employment with Southern California Water Company.

Mr. Brewer also takes an active role in public policy that affects the water industry, and was appointed by his peers to serve as the Convenor (President) of the California Urban Water Conservation Council for the Calendar year 1998. Mr. Brewer was recently selected to serve as one of 59 members on the state Department of Water Resources Public Advisory Committee which is charged with providing input for the preparation of the next California Water Plan Update, Bulletin 160-2003. He represents the California Water Association on this board.

Before arriving at SCWC, Mr. Brewer worked in a variety of management roles for corporations including Bechtel, Flying Tigers and ARAMCO. He has a Bachelor of Science Degree in Business and Industrial Management from San Jose State University. He and his bride of 33 years, Perilla, have a daughter, Alexia, who is majoring in Landscape Architecture at CalPoly in San Luis Obispo, CA and a son, Connett, who is in his senior year of high school. The Brewers reside in San Pedro, California.

Southern California Water Company – Central District

**DAVID C. MUNK**  
**Personal Background**  
(970) 963-7476

**Career Summary**

- Seventeen years of sales experience
- Eight years experience in publishing sales management
- Ten years of print advertising sales
- Twelve years of marketing and promotional design

**Experience**

|                  |  |
|------------------|--|
| 1997 to Present  | <u>Program Manager, ETL</u><br>Responsible for sales and program management for the LivingWise Program.<br>Responsible for all Western States.   |
| 1996-1997        | <u>Marketing Director, The Results Center</u><br>Handled all sales and marketing functions for this energy efficiency research firm.   |
| 1994 - 1996      | <u>President, EVOKE Marketing</u><br>Firm provided a full range of creative marketing services, including promotional design and implementation; brochure design and production; sales assistance; sponsorship acquisition, public relations, direct mail and market research. |
| 1987 to 1994     | <u>Vice President, Associate Publisher, Pocket Guide Publications</u>  |
| 1986 - 1988      | <u>Advertising Sales Director, DanceAspen</u>  |
| 1984-1986        | <u>Syndication Director, New Visions, Inc.</u>   |
| 1983-1984        | <u>Marketing Director, Colorado Life Magazine</u>  |
| 1980- 1983       | <u>Credit Assistant/Inside Sales, Westinghouse Electric Supply</u>   |
| <b>Education</b> | Bachelor of Science degree with Highest Honors, Business Management from University of California, Davis. 1979.  |

**DAVID A. HILL**  
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**Education:**

Master of Science Degree - Environmental Policy and Planning  
California State University, Fullerton, 1995  
Bachelor of Arts Degree – Political Science  
California State University, Fullerton, 1985

**Experience:**

**Senior Project Manager** - West Basin and Central Basin Municipal Water Districts, Carson, CA

West Basin and Central Basin are two quasi-government agencies that provide wholesale water to 2.3 million residents in 41 cities in the South Bay and southeast Los Angeles County. The Districts are nationally recognized as innovative leaders in water resource management. From April 1991 to present.

**Industrial Hygiene Technician** - CTL Environmental Services, Harbor City, CA

CTL is a consultant services company and testing laboratory specializing in the oversight of asbestos removal and disposal from buildings throughout the state. From February 1987 to 1991.

**Major Projects:**

- Legislative Tracking and Analyzation - Track and analyze current legislation, submit policy position papers, board memos, weekly board updates, and engage regional and statewide organizations and associations.
- CALFED Liaison - Lead agency representative on all CALFED (and Colorado River) issues.
- Ultra-Low Flush (ULF) Toilet Rebate Program - A \$3.4 million incentive program which operated for four years and replaced over 37,000 toilets in West Basin and Central Basin.
- ULF Toilet Distribution Program - A locally funded \$1.2 million annual program created to provide residents with free ULF toilets to reduce municipal demand and retail water bills.
- "Circuit-Rider" Local Government Landscape Program - A \$60,000 annual program to provide technical assistance and education to planners in the area of demand reduction in landscaping and bring municipalities in compliance with state law.
- Recycled Water Marketing – Part of a marketing team responsible for the connection of public agency lands and private businesses to the West Basin Recycled Water Program and the Central Basin Recycled Water Program.

**Publications:**

- Guest Commentary "Low flow toilets check the use of water," Whittier Daily News, August 1, 1997.

- Author “Water Districts and Urban Planners: Developing Partnerships for Water Conservation In Landscaping for the Urban Environment,” Proceedings of Conserv ‘96, 1996.
- Co-author “Water Plan ‘95” - Urban Water Management Plan, 1995.
- Author “Recycled Water Handbook: An Introduction to and Resource Guide to Using Recycled Water,” 1995.
- Author “Injury and Illness Prevention Plan” 1992.
- Co-author “Urban Water Shortage Contingency Plan”, 1992.

**Video Publications:**

- “Drought-Proof 2000,” 1996 - Co-authored a script for a West Basin and Central Basin promotional video.
- “Making Recycled Water Work,” 1995 - Co-authored the script for a training video for utility personnel on the requirements of using recycled water.

**Affiliations:**

- American Water Works Association
- American Red Cross - Los Angeles Chapter